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Amendment: Materials Management
Plan for Management of Soil During
Phase III Construction, I-70
Modifications, Brighton Boulevard to
Humboldt Avenue (CDOT Project No.
IR-IM(CX)070-4(145).

WALSH Project Number: 3027-010
May 6, 1999



Environmental Scientists and Engineers, Inc.

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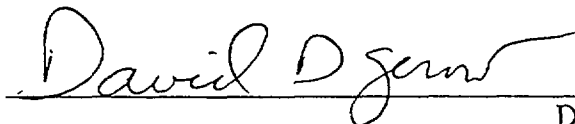
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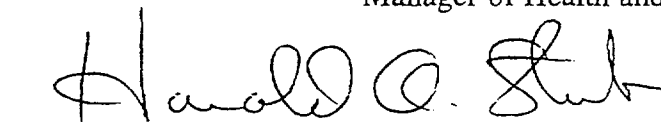
Prepared for: Mr. Steve Sherman
Colorado Department of Transportation
Region 6 Environmental
2000 South Holly Street
Denver, CO 80225

Prepared by:



Dave Gerow, CIH, CSP
Manager of Health and Safety Services

Reviewed by:



Harold A. Stuber, Ph.D.
Principal Chemist

Submitted by
WALSH ENVIRONMENTAL SCIENTISTS AND ENGINEERS, INC.
4888 Pearl East Circle, Suite 108
Boulder, Colorado 80301
(303) 443-3282

WALSH Project Number: 3027-010

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Amendment: Materials Management Plan for Management of Soil During Phase III Construction, I- 70 Modifications, Brighton Boulevard to Humboldt Avenue (CDOT Project No. IR-IM(CX)070-4(145).

1 Introduction and Purpose

This document is an amendment to the Materials Management Plan, Phase II and III Construction, I-70 Modifications Humboldt/44th Streets to Brighton Boulevard (MMP, WALSH, July 24, 1998). This amendment was prepared at the request of the Colorado Department of Transportation (CDOT). CDOT is seeking to appropriately respond to the recently reported findings of elevated arsenic and lead concentrations in near-surface soils in the proposed construction site. Arsenic and lead data have been reported by the U.S. Environmental Protection Agency (EPA, see U.S. EPA, March 1998, U.S. EPA, July 6, 1998, U.S. EPA July 20, 1998 and U.S. EPA, September 21, 1998) and Colorado Department of Public Health and Environment (CDPHE, see CDPHE, 1998).

The amendment outlines actions to be followed and objectives to be achieved by CDOT's contractors during all of Phase III construction activities on this project. The actions are intended to protect workers and the public from excess exposure to arsenic and lead from residential soils disturbed during construction. Construction is scheduled to begin in the fall of 1999 with demolition of houses and commercial structures, and final phases of construction in this area will be completed in 2003.

Figure and Table numbers in this amendment refer to figures and tables in the Phase II and III MMP (WALSH, July 24, 1998). Two terms are used in this MMP amendment as CDOT defines them. "*CDOT's construction contractor*" and "*Contractor*" refer to the construction company contracted by CDOT to complete the construction. "*Environmental specialist (ES)*" refers to the qualified environmental firm or individuals employed by the construction contractor to monitor site activities and ensure the environmental requirements and material management plan are fully complied with during construction.

2 Description of Proposed Construction Activities Affecting Residential Soils

Proposed Phase III construction is described in the MMP for Phase II and III Construction (WALSH, July 24, 1998). CDOT will construct a new roadway connecting a widened Brighton Boulevard to 44th Street, passing under the elevated portion of I-70 (See Figure 2, MMP, WALSH July 24, 1998). This roadway will be at approximately the existing grades of

Brighton Boulevard and 44th Street, and is called "relocated 46th Street by CDOT. CDOT will also construct a new ramp from Brighton Boulevard to westbound I-70. This ramp will rise from approximately the current grade of Brighton Boulevard to the elevated portion of I-70. It will be constructed on fill material.

To complete this construction, certain residences and commercial structures north of I-70 between Humboldt Street and Brighton Boulevard and south of 47th Avenue will be demolished and removed. These include properties numbered 38, 41, 43, 54-59, 69-75, 79-83, 85-90, and 93-99 (See Figure 2, MMP, WALSH, July 24, 1998, and WALSH, 1996). Non-residential structures to be demolished include structures at the Denver Fire Station No. 9 (Property 79), Darko's Automotive (Property 43), Lambert Auto Parts (Property 54), Lambert Automobile Electronics (Properties 55 and 56) and others.

Foundations, footings, concrete slabs and basements will also be demolished and removed. Existing sidewalks, driveways and roadways will be demolished and removed. Existing underground utilities in roadways will be excavated and removed or filled in place. New storm and sanitary sewer lines will be installed in the new roadway (relocated 46th Street, See Figure 2). Other excavations may be required for utility installation in relocated 46th Street.

It is anticipated that demolition of structures will begin and be completed in the fall of 1999. The remaining area between relocated 46th Street and I-70 will be sold by CDOT when all construction is completed. Completion of the final phase of construction is scheduled for the fall of 2003, and the most likely use of the remaining property between relocated 46th Street and I-70 is for parking for the Denver Coliseum and/or National Western Stock Show facilities.

3 Arsenic in Residential Soils in the Construction Area

WALSH has reviewed data obtained by the EPA (EPA July 6, 1998 and September 21, 1998) and the CDPHE (CDPHE, 1998) in the proposed construction area. The data are presented in Table 16. EPA measured arsenic and lead concentrations in 48 soil samples collected from the yards around 11 residences that will be demolished for roadway construction. Arsenic and lead were previously determined by CDPHE in two soil samples collected at two of the residences later sampled by the EPA (CDPHE, 1998).

At 9 of the 11 sampled residences arsenic was reported at concentrations below the reporting limit of the primary analytical method in all samples, or was confirmed by an independent laboratory analysis to be below an action level of 70 mg/kg for arsenic in residential soils. These locations are:

4611 Baldwin Court
4615 Baldwin Court
4639 Baldwin Court

4645 Baldwin Court
4655 Baldwin Court
4638 Franklin Street

4619 Franklin Street
4639 Franklin Street
4631 Franklin Street

In one soil sample at 4632 Franklin Street (Property 81) arsenic was confirmed to be moderately above the action level of 70 mg/kg at 82 mg/kg. Arsenic concentrations in other soil samples at these locations were below the reporting limit of the method used.

At one location, 4610 Franklin Street, four soil samples contained arsenic concentrations ranging from 250 to 1,100 mg/kg. Arsenic concentrations were reported to be below the reporting limit of the method used in 8 other soil samples collected at this residence.

There is not enough data to determine the probability of encountering arsenic concentrations above 70 mg/kg in soils at the different sampling depths, 0-4", 6-10", and 12-16".

4 Lead Concentrations in Residential Soils in the Construction Area

WALSH has reviewed data obtained by the EPA (EPA July 6, 1998 and September 21, 1998) and the CDPHE (CDPHE, 1998) in the proposed construction area. Lead concentrations in soils are presented in Table 16.

There are 9 residences that will be demolished for Phase III construction where lead was reported in excess of 500 mg/kg:

4611 Baldwin Court	4631 Franklin Street
4615 Baldwin Court	4632 Franklin Street
4645 Baldwin Court	4638 Franklin Street
4610 Franklin Street	4639 Franklin Street
4619 Franklin Street	

Lead exceeded the 500 mg/kg action level in soils collected from 0-4 inch, 6-10 inch, and 12-16 inch depths. The data presented in Table 17 shows that there is no indication that soils at 0-4 inch depths are more likely to exceed 500 mg/kg than soils at depths down to 12-16 inches.

Table 17. Soil samples where lead concentrations exceed 500 mg/kg at residences to be demolished for Phase III construction.

Depth inches	Interval	Number of Samples	Number of Samples > 500mg/kg	Percent of Samples > 500 mg/kg
0-4		32	17	53
4-8		1	1	100
6-10		11	5	45
12-16		2	1	50

5 Management of Soils to Limit Arsenic and Lead Exposure

It is CDOT's objective to protect workers and the public from exposure to arsenic and lead in soils impacted during its construction project. There is no clear pattern in the distribution of elevated lead and arsenic concentrations in near-surface soils in the construction area, and the source or sources of the contamination is not known. It is CDOT's intent to manage soils in the construction area with the assumption that any of the soil at the site may potentially contain elevated levels of lead and arsenic. This management approach provides the highest level of protection of worker and public health. It provides protection from exposure of workers to possible elevated concentrations of metals from all possibly contaminated residential soils, and from soils at commercial or roadway locations that were not sampled by EPA or CDPHE.

In order to minimize worker exposures to lead and arsenic during the construction project, and to protect the health of residents living near the construction project, CDOT will implement the following measures:

5.1 Capping of Surface Soils with Recycled Asphalt Rotomillings

The objective of capping is to limit exposure to lead and arsenic in dust that may be created from contaminated surface soils during construction activity. After demolition of a residential or commercial structure, or removal of sidewalk, roadway or other paved area, or excavation for utility removal or installation, any excavations will be backfilled, and surface soils will be graded to fill depressions. Dust control practices will be implemented in the interim between exposure of surface soils and capping. Capping of surface soils will be achieved by application of at least 4 inches of recycled asphalt rotomillings. The rotomillings will provide a suitable surface for the intended use of most of the area for construction staging. CDOT is requiring the capping of surface soils with 4 inches of rotomillings in the entire area of the Phase III construction between Brighton Boulevard, I-70, and "relocated 46th Street for the duration of the project.

There is no need to remove native soils prior to capping, except as noted in the Phase II and III MMP which specifies stockpiling and removal of materials associated with the former smelter, and of petroleum contaminated soils or other contaminated soils identified by the ES. The handling and stockpiling of any contaminated soils must be consistent with the requirements of CDOT's Standard Special Provision 250 (Environmental, Health and Safety Management).

Excavations may be required within the capped area for utility installation or removal. Any excavations in the capped area will be backfilled and compacted to a depth of 4 inches below grade and then re-capped with at least 4 inches of rotomillings. If capped areas must be re-graded for any reason, the final surface must be covered with at least 4 inches of rotomillings.

5.2 Management of Excavated Soils

Soils excavated during the project may be used for fill in foundation voids remaining after demolition of structures. Soils may also be placed in areas of the project requiring fill if the soils meet the project's minimum specified R-value (a measure of its supportive capacity). Areas requiring fill include the ramps from Brighton Boulevard to the elevated portion of I-70 and the portion of I-70 that will be filled to replace the current viaduct. Soils that must be stockpiled before they may be placed in these areas due to project scheduling will be adequately covered with clean fill material to prevent the dispersion of the lead and arsenic containing dusts. Clean material must meet the requirements of CDOT's Standard Special Provision 106 (Contractor Source Material).

The handling of excavated soils will be consistent with CDOT's Standard Special Provision 250 (Environmental, Health and Safety Management) Section 250.05 (Material Handling).

Soils excavated from the project area during utility removal or installation will either be backfilled into the excavation and capped with 4 inches of rotomillings, or be placed in an area of the project that requires fill material, if the soil meets the project's R-value specification. Any soils stockpiled or placed in areas requiring fill must be adequately covered with clean material (per CDOT's Standard Special Provision 106) to prevent fugitive dust.

5.3 Dust Control

In order to prevent the spread of lead or arsenic containing dusts during construction activities, a comprehensive dust control plan will be designed and strictly enforced by the construction contractor's environmental specialist. The dust control plan will be developed by CDOT and the construction contractor and will specify dust control methods and equipment that will be used to minimize the dispersion of dusts from the site during demolition of structures, and during the excavation, loading, and transportation of contaminated materials. Five copies of the dust control plan will be submitted by the contractor prior to construction so that it may be concurrently reviewed by CDOT, CDPHE, and EPA.

The dust control plan will specify the frequency and duration of dust suppression applications. Dust suppression techniques that may be implemented as a part of the dust control plan include: watering of surface soils, the use of other dust palliatives for dust control, covering construction roads with asphalt or rock to keep dust to a minimum, or vegetating clean cover material on unused areas. The plan will also specify airborne dust concentrations that should not be exceeded before additional dust control methods will be implemented. This plan will also apply to dust control for surfaces capped with clean material.

The effectiveness of dust control shall be evaluated by real time dust monitoring. The air monitoring program should measure airborne particulate matter less than 10 microns (PM-10), and should measure arsenic and lead concentrations in the particulates. The EPA (U.S. EPA, April 16, 1999) has recommended that the dust control program should be designed to ensure

compliance with the following air quality standards and guidelines at representative locations surrounding active work areas:

Table 18. Air Quality Standards and Guidelines Recommended by U.S. EPA for Dust Monitoring During Phase III Construction.

POLLUTANT	AVERAGING TIME	AIR QUALITY STANDARD	REFERENCE
PM-10	Annual arithmetic mean	50 $\mu\text{g}/\text{m}^3$	National Ambient Air Quality Standard (40CFR 50.6)
PM-10	24 hour average	150 $\mu\text{g}/\text{m}^3$	National Ambient Air Quality Standard (40CFR 50.6)
Lead	Maximum arithmetic mean averaged over a calendar quarter	1.5 $\mu\text{g}/\text{m}^3$	National Ambient Air Quality Standard (40CFR 50.12)
Arsenic	24 hour average	333 ng/m (screening level)	OSHA Permissible Exposure Limit divided by a safety factor of 30

5.4 Sediment Control

In order to prevent the dispersion of contaminated or uncontaminated sediments from flowing off site during rain events, CDOT and the construction contractor will implement a program of sediment control during all phases of the Phase III construction project. This program will fulfill the requirements of CDOT's Standard Special Provision, Section 208 (Erosion Control). The program will include procedures and equipment that will be used to protect surface soils from erosion and to protect inlets to storm sewers and surface waters from the infiltration of water borne sediments from the project area. The program and equipment will be monitored closely by the project environmental specialist to ensure effective implementation of the specified procedures.

5.5 Monitoring by a Qualified Environmental Specialist

The construction contractor will employ a qualified environmental specialist to monitor site construction activities. The contractor's environmental specialist will ensure that all provisions of this materials management plan are followed. In accordance with the dust control plan, the environmental specialist will utilize visual observations and suitable real-time dust monitoring devices to assure that excessive dust is not generated by site activities. Action levels and monitoring techniques for dust that are sufficiently protective of worker safety and the public will be specified in the dust control plan, which will be reviewed and approved by CDOT prior to construction.

In order to address potential concerns of the nearby residents and the public about possible air quality impacts from the construction activities, the environmental specialist will be prepared to direct those who visit or make inquiries at the project site to appropriate contacts at CDOT, CDPHE and EPA. The environmental specialist will carry a list of telephone numbers of CDOT, CDPHE, and EPA representatives who are familiar with the project and can discuss the issues with the public. The list of contacts and telephone numbers will be supplied by CDOT prior to construction.

6 References

- CDPHE, 1998. XRF and ICP Analytical Data for 25 Soil Samples Collected in the Elyria and Swansea Neighborhoods. (Rec'd. January 5, 1998).
- U.S. EPA, March 1998. Sampling and Analysis Plan, North Denver Residential Soils. Prepared by URS Operating Services under Contract No. 68-W5-031.
- U.S. EPA, July 6, 1998. Sampling Analysis Report for Removal Site Assessment, North Denver Residential Soils, Denver, Colorado. Prepared by URS Operating Services under Contract No. 68-W5-031.
- U.S. EPA, July 20, 1998. Addendum to Final Sampling and Analysis Plan for Removal Site Assessment, Vasquez Boulevard/I-70 Site, Denver Colorado, Letter from URS Operating Services to U.S. EPA..
- U.S. EPA, September 21, 1998. Sampling Analysis Report-Phase II Sampling for Removal Site Assessment, North Denver Residential Soils, Denver, Colorado. Prepared by URS Operating Services under Contract No. 68-W5-031.
- U.S. EPA, April 16, 1999. Review of Materials Management Plan, I-70 Phase II and III Construction, 44th Street to Brighton Boulevard. Letter to Jim Paulmeno of CDOT from Bonnie Lavelle, Remedial Project Manager, U.S. EPA Region 8.

Walsh Corporate Office
4888 Pearl East Circle, Suite 108
Boulder, Colorado 80301-2475
Phone (303) 443-3282 FAX (303) 443-0367

Western Slope Office
255 Main Street
Grand Junction, Colorado 81501
Phone (303) 241-4636 FAX (303) 241-4312

Midwest Division
Bloomfield Hill Professional Park
9802 Nicholas St., Suite 105
Omaha, Nebraska 68114
Phone (402) 393-1010 FAX (402) 393-1651

